Impact of Negative Life Events and Social Support on Nonsuicidal Self-Injury Among Chinese Middle School Students

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Abstract

The field of nonsuicidal self-injury (NSSI) is dominated by research conducted with Caucasian majority samples in Western countries such as North America and Europe. Far less NSSI-related research is conducted in non-Western cultures, even though NSSI behavior is a growing issue in China where studies have found that NSSI among youth occurs at a higher prevalence and has an earlier onset as compared to Western studies. Based on the data collected from middle school students in Xi'an, China, this article tries to figure out the predictive factors that are related to adolescents' NSSI using gender analysis, specially negative life events and social support, and the following conclusions are drawn: (a) There is no significant gender difference in the prevalence of NSSI of middle school students. (b) Negative life events are the risk factors of middle school students' NSSI engagement. Individuals with higher scores of negative life events are more likely to have NSSI. (c) Social support is a protective factor of middle school students' NSSI, which has main effect and also as a moderator to NSSI, individuals received more social support are less likely to engage in NSSI.

Keywords

NSSI, middle school students, negative life events, social support, gender difference

Introduction

Nonsuicidal self-injury (NSSI) is the direct, deliberate destruction of one's own body tissue in the absence of suicidal intent (Nock, 2009). Over the past 30 years, the field of NSSI research has focused primarily on Caucasian Western samples, largely conducted in North America and Europe (Gholamrezaei et al., 2017). The prevalence, characteristics, risk factors, and mechanism of NSSI among youth have been almost exclusively studied in countries where a majority of the population is Caucasian (Taliaferro & Muehlenkamp, 2015; Whitlock et al., 2013). Especially with lifetime prevalence rate of 14%–15% among adolescents (Hilt & Cha, 2008), defined by the World Health Organization as any person between the ages of 10 and 24 are the high risk group of NSSI (Curtis, 2015).

Definition of NSSI and Its Prevalence Among Adolescents in China

After 2010, studies of NSSI-related studies from non-Western cultures in non-Western contexts have begun to emerge (Gholamrezaei et al., 2016). Specifically, Chao, Yang, and Luo conducted a study in China where 960 university students (M_{age} = 18.69; 66.4% female) from different majors were asked to complete a questionnaire to assess NSSI and reported that NSSI occurs at a higher prevalence (35.2% and 20.4% of male and female's lifetime NSSI prevalence) and has an earlier onset (the eldest being 24 and the youngest 15 years) in China compared to Western studies (Chao et al., 2016). Another study with 820 middle school students (age = 13–14 years; 47% female) where participants were asked to complete open-ended questionnaires assessing the presence or absence of NSSI. Results revealed a high prevalence of past year

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engagement in NSSI of 57.4% with a mean age of onset of 13.43 (Ling, 2009). This study suggests a much higher rate of engagement in NSSI over the past year and an earlier age of onset relative to much of the research from Western contexts (Jiang et al., 2011; Ling, 2009; Yang & Feldman, 2018; Yang & Luo, 2013; Zhang & Tao, 2008).

This article takes middle school students as the research object, and defines NSSI behavior as "the deliberate destruction of one's body tissue (e.g., cutting, burning, bruising) without suicidal intent, that occurs among middle school students."

NSSI and Negative Life Events

Negative life events refer to the changes and stimulations in individuals' family, work, and/or study environments, which may result in negative psychological and physiological outcomes (Zhang et al., 1987). Negative life events are not only an important factor affecting individuals' physical and mental health, but can also influence individuals' engagement in NSSI. A study has reported that life stress brought on by negative life events plays a unique role in the occurrence of NSSI whereby individuals with higher life stress also report engaging in NSSI behaviors (Liu & Miller, 2014). Researchers have reported that interpersonal stress that results from negative life events is correlated with the occurrence and frequency of NSSI; however, the mechanism of this relationship remains unclear.

NSSI and Social Support

Social support is an individual's perception of external support from one's family, friends, or other relationships that one wants or can get (Wu et al., 2011). The research on social support originated from sociology, and then the concept of social support was introduced into psychiatry. With the application of quantitative assessment methods and the deepening of research, social support has become the focus of many disciplines (e.g., sociology, education, psychology, and epidemiology). Effective social support can enhance one's ability to tolerate and decrease the risk of putting oneself into dangerous situations. Wu (2011) stated that strengthening supportive relationships and access to an effective network of community resources can help reduce the occurrence of self-injury. Furthermore, Mogens et al. (2015) reported that increasing social support effectively reduced the likelihood of NSSI behaviors among a group of adolescents who were determined to be at a high intention in NSSI. Social support has also been reported to enhance individuals' tendency to seek help prior to the occurrence of self-injury (Wu et al., 2011). According to Gong, self-injury may occur as a result of extreme stress due to self-imposed pressures; however, social support has been reported to act as a buffer against stress (Gong, 1994) whereby those who face the same pressures may experience better physical and mental health by obtaining effective social support (Tu & Guo, 2011). Social support may be a protective factor against engagement in self-injury through its effect on buffering the negative outcomes of extreme stress.

Although current literature hints that negative life events and social support are important variables to study when examining NSSI, little has been done to clarify the unique role of negative life events and social support in the NSSI of middle school students. As such, there is a need for further research on the relationship between these variables to understand the emergence of NSSI in this age group as well as to determine whether there are gender differences. This early onset and high prevalence clearly indicates the need for better understanding of the protective and risk factors for NSSI, within the Chinese context. The present study seeks to examine the unique role of negative life events and social support on NSSI engagement among a group of middle school students in China.

The overarching objective of this study is to determine the role of social support and negative life events in NSSI engagement, specifically, the present study seeks to assess whether social support can serve as a protective factor against NSSI engagement, and whether negative life events can act as risk factors in NSSI among middle school students. Given inconclusive evidence in the literature, the present study also seeks to assess whether any gender differences in NSSI exist within this group, and an exploratory approach was taken to examine gender differences.

Thus, three hypotheses are listed as follows:

1. It was hypothesized that there would be gender difference in the prevalence of middle school students' NSSI.
2. It was hypothesized that higher scores on the negative life events would predict higher frequency of NSSI among both genders, which could indicate negative life events as one risk factor for NSSI.
3. It was also hypothesized that more social support received would lower the engagement of NSSI for both genders, which could indicate social support as a protective factor for NSSI.

Method

Participants

Participants consisted of a total of 1,180 middle school students (655 males, 525 females, M_{age} = 15.6 years, age range: 11–24 years) who were recruited to complete questionnaires from seven middle schools in Xi'an, China. Please refer to Table 1 for details. Ethics approval

Table 1. Respondent Characteristics.

	Frequency	Percentage (%)
Gender		
Male	655	55.5
Female	525	44.5
Age		
14–17	983	83.3
18–24	87	7.4
Ethnic groups		
Han majority	1,138	96.4
Hui minority	13	1.1
Other minorities	23	1.9
Father's educational level		
Middle school and below	763	46.1
College and above	361	24.8
Mother's educational level		
Middle school and below	790	66.9
College and above	333	22.6
Single child or not		
Yes	648	54.9
No	524	44.4
Parents' marital status		
First marriage	1,039	88.1
Remarriage	58	4.9
Divorced	43	3.6
Widowed	12	1.0

was obtained from the institutional ethics review board within Xi'an Jiaotong University. Participant information sheets and consent forms were approved by the committee and in line with the standardized documents for the University. All participants were approached as healthy volunteers participating in different groups. All were deemed to have capacity to consent to participation and due to the fact that the study included young students below 18, the parents of all participants provided informed consent for all aspects of the study.

Measures

NSSI Status. In order to assess adolescents' engagement in NSSI, the Nonsuicidal Self-Injury Assessment Tool (NSSI-AT; Whitlock & Purington, 2007a, b) was selected and translated into Chinese. By asking, "have you ever done anything that you didn't intentionally harm yourself for the purpose of suicide?", measured as "0 = no, 1 = yes." Based on the 14 kinds of NSSI behaviors stipulated by NSSI-AT, this study refers to the relevant research of middle school students in the Chinese background and adds four kinds of specific NSSI behaviors, including "1. Swallowing items that cannot be digested (e.g., plastic, stone); 2. Taking or swallowing too much (beyond the medical advice); 3. Take illegal

drugs, (e.g., methamphetamine, ecstasy, etc.); and 4. Burn yourself with cigarette butts". A total of 18 specific NSSI behaviors are defined. The internal consistency of this scale was found to be adequate for the present study ($\alpha = .82$).

Negative Life Events. The Adolescent Self-Rating Negative Life Events Checklist (ASNLEC; Liu et al., 1997) was used to examine negative life events. This scale consists of 27 items that address 6 life domains including interpersonal relationships (e.g., got misunderstood or wronged, got discriminated against or treated coldly), learning pressures (e.g., failure in the exam), punishment (e.g., got criticized or punished at school), loss (e.g., sudden death of relatives or friends, got stolen or lost items), adaptation (e.g., transfer or suspension, major changes in daily routines), and others (e.g., family financial problems). The original scale asks participants to rate each item on a five-point Likert scale in terms of the degree of impact each even had on their life from "no impact" to "extremely severe." The scale was adapted in the present study to accommodate participants' age and better distinguish the relative impact of negative life events. In this study, participants were asked to rate each life event on a three-point Likert scale: "never happened," "happened with little effect," and "happened with mass effect." The total score of negative life was calculated as the sum of scores where higher scores indicated greater impact of negative life events on one's life. In the current study, the ASNLEC demonstrated excellent reliability ($\alpha = .87$).

Social Support. Wang's Perceived Social Support Scale (PSSS; Wang, 1999) was used to assess social support among middle school students. This scale consists of 12 items to tap into different sources of social support to assess the degree to which participants receive support from different individuals/groups within their social network (e.g., friends, family, and colleagues). In the present study, the "leaders, relatives, and colleagues" items were adapted to "teachers, classmates, and relatives" considering that students do not have much interaction with leaders or colleagues in their daily life. Participants were asked to rate each item on a five-point Likert scale from "no support" to "support always" whereby higher overall scores indicating greater social support. The PSSS was found to have excellent internal reliability in the present study ($\alpha = .94$). In addition, demographic variables (e.g., age and segment) were included in this study.

Procedure

The present study employed convenience sampling to recruit teachers through the school administration within seven different middle schools who expressed interest in

having their students participate in this study. Meanwhile, stratified sampling was used to recruit participants to complete measures to ensure equal representation of gender as well as different grade levels within middle school (from grade 2 in middle school to grade 3 in senior high school). Each student who took part in the survey received 10¥as compensation for taking their time. A total of 1200 questionnaires were distributed and 1180 valid questionnaires were recovered; therefore, the completion rate in the present study was 98.33%.

Data Analysis

Independent sample *t*-tests and chi-square test were adopted to analyze the gender differences in NSSI engagement, negative life events, and social support among students. Furthermore, a step-wise binary logistic regression was used to examine whether negative life events (Step 1), social support (Step 2), and demographic variables (Step 3) were predictive of NSSI status (models 1–3) in males. This analysis was repeated for female students as well (models 4–6).

Results

The results of gender comparison of the prevalence of NSSI between both genders were presented from Table 2. The number of NSSI of male students is 163, accounting for 37.6% of male students; the number of NSSI of female students is 132, accounting for 39.1% of female students. Chi-square test results showed that there was no significant difference in the prevalence of NSSI between male and female students.

The scores of life events of male students ($M = 18.8035$) were identified to be slightly higher than that of females ($M = 18.5944$), but the difference did not show notable statistical significance. The scores of social support of female students ($M = 42.5968$) were identified to be significantly higher ($F = 4.346$, $p < .01$) than males ($M = 40.6079$).

The regression analysis results of negative life events and social support on the NSSI prevalence of male students were presented from Table 3. In model 1, the results showed that negative life events had a positive impact on the NSSI of male students (EXP(β) $= 0.038$, $p < .001$). Model 2 was based on model 1, and the score of "male students' social support" was included in the regression model. Regression results showed that negative life events still had a positive impact on male students' NSSI, while social support had a negative impact on male students' NSSI (EXP(β) $= -0.036$, $p < .001$). Model 3 was based on model 2. Demographic variables (e.g., age, segment) were included in the regression model. At this time, the regression results had changed, and the positive influence

Table 2. Comparison of the Prevalence of NSSI Between Male and Female Students.

Male		Female	
Cases/Per (%)		Cases/Per (%)	
NSSI	No NSSI	NSSI	No NSSI
163/37.6%	271/62.4%	132/39.1%	206/60.9%
$X^2 = 0.71$			

Note. NSSI = nonsuicidal self-injury, $+p < .1$; $*p < .05$; $**p < .01$; $***p < .001$.

coefficient of negative life events on the NSSI of male students had decreased significantly (EXP(β) $= 0.035$, $p < .05$). However, the negative influence coefficient of social support on male students' NSSI increased, and the significance decreased significantly (EXP(β) $= -0.033$, $p < .01$).

With the increase of independent variables and the inclusion of control variables, the explanatory power of models 1–3 was further enhanced. Cox and Snell R^2 coefficients in models 1–3 were gradually increased (0.033, 0.070, 0.142), and Nagelkerke R^2 coefficients in models 1–3 were gradually increased (0.045, 0.097, 0.188).

The regression analysis results of the negative life events and social support on female students' NSSI status were presented from Table 4. The analysis results in model 4 showed that negative life events had a positive impact on female students' NSSI (EXP(β) $= 0.044$, $p < .001$). Model 5 was based on model 4. The regression results showed that negative life events still had a positive impact on female students' NSSI, and the significance was reduced (EXP(β) $= 0.042$, $p < .01$). Social support had a negative impact on female students' NSSI (EXP(β) $= -0.029$, $p < .01$). Model 6 was based on model 5. The regression results changed, and the positive influence of negative life events on female students' NSSI disappeared significantly (EXP(β) $= 0.028$, $p > .1$), while the negative influence coefficient of social support on female students' NSSI decreased (EXP(β) $= -0.005$, $p < .01$).

With the increase of independent variables and the inclusion of control variables, the explanatory power of models 4–6 is further enhanced. Cox and Snell R^2 coefficients in models 4–6 increase gradually (0.035, 0.058, 0.136). Nagelkerke R^2 coefficients in models 4–6 also increase gradually (0.047, 0.078, 0.195).

Discussion

From the descriptive results, the prevalence of NSSI among male students is 37.6% and that of female students is slightly higher (39.1%) than that of male students, which is not only higher than the survey results of Western

Table 3. Logistic Regression Predicting NSSI Status of Male Students.

Whether NSSI Occurs (Reference: No)		Model 1	Model 2	Model 3
Negative life events		.038***	.039***	.035*
Social support			−.036***	−.033**
Age (reference: 17 and below)	18 and above			−.449
Segment (reference: junior middle school)	Senior middle school			−.671+
−2 log likelihood		549.287***	519.478***	351.625***
Cox and Snell *R*²		.033	.070	.142
Nagelkerke *R*²		.045	.097	.188

Note. NSSI = nonsuicidal self-injury, +*p* < .1; *p < .05; **p < .01; ***p < .001.

Table 4. Logistic Regression Predicting NSSI Status of Female Students.

Whether NSSI Occurs (Reference: No)		Model 4	Model 5	Model 6
Negative life events		.044***	.042**	.028
Social support			−.029**	−.005**
Age (reference: 17 and below)	18 and above			−.091**
Segment (reference: junior middle school)	Senior middle school			−.116
−2 log likelihood		459.437***	438.527***	351.625***
Cox and Snell *R*²		.035	.058	.136
Nagelkerke *R*²		.047	.078	.195

Note. NSSI = nonsuicidal self-injury, +*p* < .1; *p < .05; **p < .01; ***p < .001.

countries (Burke et al., 2015; Ross & Heath, 2002; Whitlock, et al., 2007a, b), but higher than the survey results among Chinese middle school students (Wang & Wang, 2009; Xiao et al., 2008), but gender difference did not show too much significance. This finding is consistent with the conclusion of Yang, indicating that the hypothesis of "boy crisis" or "girl risk" of NSSI behavior of middle school students in China has not yet been confirmed (Yang & Xin, 2018).

In models 1–3, negative life events always have a significant positive effect on males' NSSI, indicating the higher score of negative life events, the greater the possibility of males' engagement in NSSI. This presents that negative life events are the risk factors of males' NSSI. This conclusion is consistent with Liu's study, which suggests that life pressure brought by negative life events has a unique role in the mechanism of NSSI, and the prevalence of NSSI is often higher in individuals with higher life pressure (Liu, et al., 2014). Another possible explanation is that negative life events have a cumulative effect on individual health, which means that after a period of time, individuals who encounter multiple negative life events tend to experience more adverse health consequences (Kanner et al., 1981). The regression results of model 2 show that life events still have a significant positive impact on NSSI of males, and the significance of the

impact has not changed, indicating that social support does not have a significant moderating role in the impact of life events on NSSI of males. The possible explanation is that social support from family, school, and others is limited, which is not enough to cause the significant change of life events on their NSSI, which is consistent with the results of descriptive analysis that males had less social support. Social support had a significant negative effect on male students' NSSI. The more social support males received, the less likely they would have NSSI. This proves that social support is an important protective factor for males' NSSI, which is consistent with the conclusion drawn by Wu, that social support network could adjust the help seeking behavior of adolescents before self injury, so as to reduce or inhibit the prevalence of NSSI behavior (Wu et al., 2011). Model 3 included control variables for regression; the results showed that life events still had a positive predictive effect on males' NSSI, and social support showed a negative effect on males' NSSI. Meanwhile, the explanatory power and significance of the two variables are significantly reduced. This means that some control variables may represent the existing or unclear variables in life events and social support. In terms of the impact on the NSSI of males, these variables had a substitution relationship with specific negative life events and different social support. The regression results of model 3

showed that compared with junior high school, senior high school males are less likely to have NSSI. This is consistent with the proposition of development maturity theory, compared with junior high school students, senior high school students have better physical and mental development and more mature mental level, so they are more inclined to solve problems in a rational and nonextreme way (O'Hara, 2006).

The regression analysis results of model 4 showed that life events had a significant positive effect on NSSI among females, that is, indicating the higher score of negative life events, the greater the possibility of females' engagement in NSSI. This indicates that life events are the risk factors for females' NSSI. This conclusion is similar to that of males, but the difference is that negative life events had a higher positive explanatory power on females' NSSI than males, combined with descriptive analysis, it can be proved that the reason is that females' NSSI is also slightly higher than males' NSSI. The results of model 5 show that negative life events still had a significant positive effect on female students' NSSI, but their coefficient size and significance were reduced, indicating that social support has a moderating effect on the impact of negative life events on female students' NSSI. This conclusion is not consistent with the results of males' analysis. The possible explanation is that females get more social support combined with descriptive analysis, so the regulatory effect on the relationship between negative life events and NSSI became stronger. At the same time, social support had a significant negative predictive effect on females' NSSI, that is, females received more social support were less likely to have NSSI. This shows that social support is a protective factor for females' NSSI. This result is also consistent with Wu et al. (2011). The regression results of model 6 show that the positive influence of life events on female students' NSSI disappeared, which may be due to the following reasons: first, social support plays a more important moderating role; second, some control variables may represent the existing or unclear variables in negative life events, and these variables and specific different life events are mutually substituted on the impact of females' NSSI engagement. Segment had a significant negative predictive effect on female students' NSSI, that is, compared with females under 16 years old, females over 17 years old were less likely to have NSSI, which is consistent with the existing research (Sourander et al., 2006).

Limitations

The data used in the empirical part of the article are from the middle school students' health risk survey carried out by the research team in Xi'an City, Shaanxi Province, China. Therefore the sample in the present study can be considered representative of the population within the Western cities in China; however, this might differ from students' engagement in NSSI within eastern cities. Further studies are needed to examine NSSI within this group. In addition, the sample consists of students attending middle schools in provincial capitals, but prefecture-level, county-level, and township-level middle schools may not be represented within the present study.

In addition, this study relied only on self-report questionnaires to examine NSSI. Further investigations are needed to understand the contributors to the patterns of adolescents' engagement in NSSI.

Implications and contributions

The present study revealed differences by gender in the relationship between negative life events, social support, and NSSI engagement among middle school students in China. The findings contribute to existing literature on NSSI among Chinese adolescents while emphasizing the need for continued efforts to explore NSSI across different cultures and societies.

Conclusions

To conclude, not as hypothesized, there is no significant gender difference in the prevalence of NSSI of middle school students. Second, as hypothesized, negative life events are the risk factors of middle school students' NSSI engagement. Individuals with higher scores of negative life events are more likely to have NSSI. Third, as hypothesized, social support is a protective factor for middle school students' NSSI, which directly moderates the NSSI and has direct main effect, individuals received more social support are less likely to have NSSI.

Declaration of Conflicting Interests

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